Claims

[c1] 1. A back light module for providing a full-color surface light source, comprising:
a surface light source;
a light-shielding matrix formed on the surface of the surface light source, wherein the light-shielding matrix has a plurality of lattice points that exposes the underlying surface light source; and
a fluorescent layer formed inside the lattice points.

[c2] 2. The back light module of claim 1, wherein the surface light source comprises a cold cathode fluorescent flat lamp.

[c3] 3. The back light module of claim 1, wherein the surface light source furthermore comprises:
a light-guiding plate having a light-receiving surface, a light-emitting surface and a light-diffusing surface;
a reflective holder positioned close to the light-receiving surface; and
a linear light source enclosed by the reflective holder.

[c4] 4. The back light module of claim 2, wherein the light-diffusing surface has a plurality of V-cuts.

[c5] 5. The back light module of claim 2, wherein the linear light source is selected from a group consisting of a cold cathode fluorescent lamp and a light-emitting diode array.

[c6] 6. The back light module of claim 1, wherein the fluorescent layer comprises:
a plurality of first fluorescent-based material for converting the light from the surface light source into a first color;
a plurality of second fluorescent-based material for converting the light from the surface light source into a second color; and
a plurality of third fluorescent-based material for converting the light from the surface light source into a third color.

[c7] 7. The back light module of claim 6, wherein the first fluorescent-based material, the second fluorescent-based material and the third fluorescent-based material are arranged to form a mosaic pattern, a triangular pattern, a stripe pattern or a four-pixel pattern.

[c8] 8. The back light module of claim 1, wherein the surface light source provides a light source with a first color and the fluorescent layer is formed in some of the lattice

points only, the fluorescent layer comprises:
a plurality of first fluorescent-based material for converting the first color light from the surface light source into a second color; and
a plurality of second fluorescent-based material for converting the first color light from the surface light source into a third color.

[c9] 9. The back light module of claim 8, wherein the first fluorescent-based material, the second fluorescent-based material and the lattice point without any fluorescent material are arranged to form a mosaic pattern, a triangular pattern, a stripe pattern or a four-pixel pattern.

[c10] 10. A liquid crystal display, comprising:
a back light module, comprising:
a surface light source;
a light-shielding matrix formed on the surface of the surface light source, wherein the light-shielding matrix has a plurality of lattice points that exposes the underlying surface of the surface light source;
a fluorescent layer formed inside the lattice points; and
a liquid crystal display panel positioned over the back light module.

[c11] 11. The liquid crystal display of claim 10, wherein the

surface light source comprises a cold cathode fluorescent flat lamp.

[c12] 12. The liquid crystal display of claim 10, wherein the surface light source furthermore comprises:
a light-guiding plate having a light-receiving surface, a light-emitting surface and a light-diffusing surface;
a reflective holder positioned next to the light-receiving surface; and
a linear light source enclosed within the reflective holder.

[c13] 13. The liquid crystal display of claim 12, wherein the light-diffusing surface has a plurality of V-cuts thereon.

[c14] 14. The liquid crystal display of claim 12, wherein the linear light source is selected from a group consisting of a cold cathode fluorescent lamp and a light-emitting diode array.

[c15] 15. The liquid crystal display of claim 10, wherein the fluorescent layer comprises:
a plurality of first fluorescent-based material for converting light from the surface light source into a first color;
a plurality of second fluorescent-based material for converting light from the surface light source into a second color; and

a plurality of third fluorescent-based material for converting light from the surface light source into a third color.

[c16] 16. The liquid crystal display of claim 15, wherein the first fluorescent-based material, the second fluorescent-based material and the third fluorescent-based material are arranged to form a mosaic pattern, a triangular pattern, a stripe pattern or a four-pixel pattern.

[c17] 17. The liquid crystal display of claim 10, wherein the surface light source provides a light source with a first color and the fluorescent layer is formed in some of the lattice points only, the fluorescent layer comprises:
a plurality of first fluorescent-based material for converting the first color light from the surface light source into a second color; and
a plurality of second fluorescent-based material for converting the first color light from the surface light source into a third color.

[c18] 18. The liquid crystal display of claim 17, wherein the first fluorescent-based material, the second fluorescent-based material and the lattice point without any fluorescent material are arranged to form a mosaic pattern, a triangular pattern, a stripe pattern or a four-pixel pattern.

[c19] 19. The liquid crystal display of claim 10, wherein the liquid crystal display panel furthermore comprises:
an array substrate;
an opposite substrate formed over the array substrate; and
a liquid crystal layer sandwiched between the array substrate and the opposite substrate.

[c20] 20. The liquid crystal display of claim 19, wherein the array substrate comprises a thin film transistor array substrate with an interior surface having an array of thin film transistors thereon and a plurality of pixel electrodes that correspond with the thin film transistors.

[c21] 21. The liquid crystal display of claim 20, wherein the display furthermore comprises a first alignment film positioned over the interior surface of the thin film transistor array substrate to cover the thin film transistors and the pixel electrodes.

[c22] 22. The liquid crystal display of claim 20, wherein the opposite substrate furthermore comprises a common electrode layer.

[c23] 23. The liquid crystal display of claim 22, wherein the display furthermore comprises a second alignment film positioned over the interior surface of the opposite sub-

strate to cover the common electrode layer.

[c24] 24. The liquid crystal display of claim 10, wherein the liquid crystal display panel furthermore comprises:
a bottom substrate;
a top substrate positioned over the bottom substrate; and
a liquid crystal layer sandwiched between the top substrate and the bottom substrate.

[c25] 25. The liquid crystal display of claim 24, wherein the bottom substrate has a plurality of first stripe electrodes and the top substrate has a plurality of second stripe electrodes such that the first stripe electrodes extend in a direction perpendicular to the second stripe electrodes.

[c26] 26. The liquid crystal display of claim 25, wherein the display furthermore comprises a first alignment film positioned over the interior surface of the bottom substrate to cover the first stripe electrodes.

[c27] 27. The liquid crystal display of claim 25, wherein the display furthermore comprises a second alignment film positioned over the interior surface of the top substrate to cover the second stripe electrodes.

[c28] 28. The liquid crystal display of claim 10, wherein the display furthermore comprises a first polarizing plate

and a second polarizing plate such that the first polarizing plate and the second polarizing plate are attached to the surface of the liquid crystal display panel.

[c29] 29. The liquid crystal display of claim 10, wherein the display furthermore comprises a prism positioned between the liquid crystal display panel and the back light module.